Habitat use and diving behavior of immature Steller sea lions in the Aleutian Islands

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Manuscript Overview

Previous analyses (Merrick and Loughlin 1997, Loughlin et al. 2003) described diving and trip behavior of immature Steller sea lions, including some from the Aleutian Islands, but those analyses did not specifically examine links between diving behavior and at-sea location. This analysis will explore the relationships between sea lion diving and travel behavior in relation to age of animal, time of year, and location (and hence bathymetry and oceanography) in the Aleutian Islands. Specifically, contrasts will be made between animals in the eastern and central Aleutian Islands.

From deployments of Wildlife Computers ST10 and ST16 satellite-linked dive recorders (SDRs), locations west of 164%W longitude have been obtained from 30 sea lions during 2000-2002 (2000 *n*=6, 2001 *n*=13, 2002 *n*=11). At the time of capture, most were likely not weaned (Æ9 months old *n*=26; Æ17 months old *n*=4) and hence telemetry coverage includes sea lions that likely transition to independent foraging during the instrument deployment period. Most (26) were captured near (or moved to after capture) the Unimak Pass area, with four captured at Seguam Island in the year 2000. Data to be analyzed are similar to those presented in the draft BiOp remand, but have been subjected to additional filtering.

Rather than analyzing sea lion behavior through trip reconstruction, we will subsample location-linked dive data and test for habitat associations. Through additional filtering beyond that used in the BiOp remand analysis, a "best" location associated with a 6-h time period was obtained and linked to the relevant dive histogram data for that period, thus providing a more even temporal coverage (that is, biases associated with obtaining more locations during optimal uplink periods have been removed) from which to quantify sea lion diving behavior with respect to location. Thus, statistics describing diving behavior (such as focal depth, dive focus, time at depth, etc.) or effort can be performed and tested for habitat associations (such as bathymetry, distance from shore, oceanic fronts, etc.). In addition to addressing specific issues relating Aleutian Island bathymetry and oceanography with sea lion diving behavior, the results of this paper will provide a widely applicable methodology that can be directly usable for resolving wildlife management issues, and provides a basis for comparison of habitat use for subsequent Aleutian Island instrument deployments.